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## The external benefits of higher education

Kristinn Hermannsson<sup>a</sup> , Katerina Lisenkova<sup>b</sup> , Patrizio Lecca<sup>c</sup> ,  
Peter G. McGregor<sup>d</sup>  and J. Kim Swales<sup>e</sup>

### ABSTRACT

The external benefits of higher education. *Regional Studies*. The private-market benefits of education are widely studied at the micro-level, although the magnitude of their macroeconomic impact is disputed. However, there are additional benefits of education that are less well understood. In this paper the macroeconomic effects of external benefits of higher education are estimated using the 'micro-to-macro' simulation approach. Two types of externalities are explored: technology spillovers and productivity spillovers in the labour market. These links are illustrated and the results suggest they could be very large. However, this is qualified by the dearth of microeconomic evidence, for which the authors hope to encourage further work.

### KEYWORDS

supply-side impact; higher education institutions; computable general equilibrium model; social and external benefits

### 摘要

高等教育的外部效益。 *Regional Studies*。教育私人市场在微观层级的效益受到广泛研究，尽管这些效益对宏观经济的影响程度仍然受到争议。但仍有额外的教育效益较不被清楚地认识到。本文运用“从微观到宏观”的模拟方法，评估高等教育的外部效益对宏观经济的影响。本文探讨两种类型的外部性：劳动市场的技术外溢和生产外溢。本文阐明这些连结，而研究结果显示，这些连结可能非常巨大，但却缺乏微观经济的证据，而这正是作者期盼鼓励的未来研究方向。

### 关键词

供给面影响；高等教育机构；可计算的一般均衡模型；社会与外部效益

### RÉSUMÉ

Les bénéfices externes découlant de l'enseignement supérieur. *Regional Studies*. À l'échelle microéconomique on a prêté beaucoup d'attention aux avantages du marché privé pour l'éducation, bien que l'importance de leur impact au niveau macroéconomique soit discutable. Cependant, l'éducation fournit de plus amples avantages moins bien connus. À partir des simulations 'micro-macro', ce présent article cherche à évaluer les effets macroéconomiques des avantages externes de l'enseignement supérieur. On examine deux sortes d'effets externes: les retombées sur la technologie et les retombées sur la productivité au marché du travail. On en illustre les liens et les résultats laissent supposer qu'ils pourraient s'avérer très importants. Néanmoins, cela est nuancé à la lumière de l'absence de résultats microéconomiques, d'où on souhaite encourager des recherches ultérieures.


### MOTS-CLÉS

impact sur l'offre; établissement d'enseignement supérieur; modèle d'équilibre général calculable; avantages sociaux et externes


### CONTACT

<sup>a</sup>  kristinn.hermannsson@glasgow.ac.uk


Robert Owen Centre, School of Education, University of Glasgow, Glasgow, UK.

<sup>b</sup> **(Corresponding author)**  k.lisenkova@niesr.ac.uk

Fraser of Allander Institute, Department of Economics, University of Strathclyde, Glasgow, UK.

<sup>c</sup>  patrizio.lecca@ec.europa.eu

Fraser of Allander Institute, Department of Economics, University of Strathclyde, Glasgow, UK.

<sup>d</sup>  p.mcgregor@strath.ac.uk

Fraser of Allander Institute, Department of Economics, University of Strathclyde, Glasgow, UK; and Strathclyde International Public Policy Institute (SIPPI), University of Strathclyde, Glasgow, UK.

<sup>e</sup>  j.k.swales@strath.ac.uk

Fraser of Allander Institute, Department of Economics, University of Strathclyde, Glasgow, UK.

**ZUSAMMENFASSUNG**

Externer Nutzen von Hochschulbildung. *Regional Studies*. Der privatwirtschaftliche Nutzen von Bildung wurde auf Mikroebene bereits ausführlich untersucht, doch der Umfang seiner makroökonomischen Auswirkung ist umstritten. Es gibt jedoch einen zusätzlichen Nutzen der Bildung, der weniger gut verstanden wird. Dieser Beitrag enthält eine Schätzung der makroökonomischen Auswirkungen des externen Nutzens von Hochschulbildung mithilfe eines 'Mikro-zu-Makro'-Simulationsansatzes. Untersucht werden zwei Arten von Externalitäten: technische sowie Produktivitäts-Übertragungseffekte auf dem Arbeitsmarkt. Wir illustrieren diese Zusammenhänge, die den Ergebnissen zufolge äußerst umfangreich ausfallen könnten. Allerdings gelten diese Ergebnisse aufgrund der knappen mikroökonomischen Belege nur eingeschränkt, weshalb wir hoffen, zu weiteren Arbeiten motivieren zu können.

**SCHLÜSSELWÖRTER**

Auswirkungen auf Angebotsseite; Hochschulen; berechenbares allgemeines Gleichgewichtsmodell; gesellschaftlicher und externer Nutzen

**RESUMEN**

Beneficios externos de la enseñanza superior. *Regional Studies*. Los beneficios de la educación en el sector privado se han analizado exhaustivamente a nivel micro, si bien se cuestiona la magnitud de su impacto macroeconómico. Sin embargo, existen beneficios adicionales de educación que se entienden menos. En este artículo calculamos los efectos macroeconómicos de los beneficios externos de la enseñanza superior mediante un enfoque de simulación 'micro-a-macro'. Exploramos dos tipos de externalidades: los efectos indirectos de la tecnología y los de la productividad en el mercado laboral. Ilustramos estos vínculos y los resultados indican que podrían ser muy grandes. Sin embargo, estos resultados están limitados debido a la escasa evidencia microeconómica, y esperamos que sirvan para estimular estudios adicionales.

**PALABRAS CLAVES**

impacto de la oferta; instituciones de educación superior; modelo computable de equilibrio general; beneficios sociales y externos

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**INTRODUCTION**

A range of evidence testifies to the beneficial labour market returns to education for individuals. This paper, however, aims to quantify the system-wide effects of the external impacts from individuals' education. Microeconomic evidence is used to project the direct impact of externalities upon productivity. Then a dynamic computable general equilibrium (CGE) model is used to simulate endogenous adjustments in the economy and to estimate impacts on macroeconomic aggregates. This approach is demonstrated for productivity spillovers benefiting other workers and knowledge spillovers between higher education (HE) and industry. Although the range of estimated outcomes is large, the impacts for the wider economy are in all cases substantial. This suggests that education externalities should not be ignored when formulating education policy. Furthermore, it reinforces the need to strengthen the evidence base on external benefits of education.

It is pertinent to explore the external impacts of HE as, despite significant evidence, these impacts are often ignored in the policy process. In the UK, radically different funding mechanisms for HE apply to England and Scotland. The English system largely reflects the recommendations of the Browne (2010) report which emphasizes the private benefits that graduates receive and argues that it is therefore reasonable for individuals to pay for these benefits through higher fees. From an economics perspective, such a proposal would only be socially efficient if the

external benefits of HE were negligible, though no evidence was offered on this issue by Browne (2010).

On the other hand, the Scottish government has decided on no 'upfront' fees and no 'backdoor' graduate contribution, although the number of places at higher education institutions (HEIs) for domestic students is rationed.<sup>1</sup> In practice, both English and Scottish domestic students are subsidized to a certain extent. From an economics perspective the socially optimal solution occurs where the level of subsidy reflects the excess of external over private benefits. It would be purely fortuitous if the implicit judgements in either the English or the Scottish systems about the external benefits of HE were correct.

Why are external impacts overlooked in policy design? One possibility is the relative underdevelopment of the evidence base. A second is that due to their microeconomic nature, they might not command attention in a policy environment accustomed to articulating impact in terms of macroeconomic aggregates, such as gross domestic product (GDP) and employment. Some of the evidence used in this paper is controversial, reflecting the difficulties in measuring accurately the external returns to education, and the comparatively limited body of research devoted to this to date. Part of the motivation for this paper is to identify more clearly the gaps in the knowledge of the external impacts of HE.

**BENEFITS OF EDUCATION**

This paper differentiates four types of returns to (or benefits of) education (Table 1): private market returns,